

CLAIMS

1. Device for heating-ventilation and/or air-conditioning the passenger compartment of a motor vehicle, including means for producing a pulsed air flow at an adjusted temperature, as well as outlets for defrosting, aeration
5 and foot-warming which are supplied by this adjusted air flow and are suitable for being connected to ducts leading into the passenger compartment,

characterised in that it consists of modules grouped substantially at the same horizontal level and including:

10 - at least one ventilation module (14) arranged to produce a pulsed air flow;

- at least one heating module (12) arranged to be placed in a central area of the passenger compartment and comprising an air inlet (28) for pulsed air, heat
15 exchangers (32, 34, 36) through which the air flow can pass and at least one side air outlet (46d, 46g); and

- at least one distribution module (16) with an inlet (50) connected to a side air outlet (46d, 46g) of the heating module and comprising distribution means for
20 distributing the air flow between the air outlets (54, 56, 58) leading to selected areas of the passenger compartment.

2. Device according to claim 1, characterised in that the
25 heating module (12) comprises two side air outlets (46d, 46g) opening from the left and right sides, respectively, and in that the device includes two distribution modules (16) arranged to be placed on the right and left sides, respectively, of the heating module, each having an inlet

(50) connected to a side air outlet (46d, 46g) of the heating module.

3. Device according to one of claims 1 and 2,
5 characterised in that the ventilation module (14) is placed next to the heating module (12) in the transverse direction (Y-axis) of the vehicle.

4. Device according to one of claims 1 and 2,
10 characterised in that the ventilation module (14) is placed next to the heating module (12) in the longitudinal direction (X-axis) of the vehicle.

5. Device according to one of claims 1 to 4,
15 characterised in that the ventilation module (14) includes an air inlet unit (18) for outside air and/or recirculated air, a turbine (22) for producing a pulsed air flow, and an outlet channel (26) for leading the pulsed air to the inlet (28) of the heating module.

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6. Device according to one of claims 1 to 5,
characterised in that the inlet (28) of the heating module (12) is located in the lower portion thereof, and in that the heating module (12) houses, from bottom to
25 top, an air-conditioning evaporator (32) and at least one heating radiator (34, 36).

7. Device according to claim 6, characterised in that the heating module (12) houses a first heating radiator (34)
30 through which a heat transfer fluid passes, placed above the evaporator (12), as well as a second electric heating

radiator (36) placed above the first heating radiator (34).

8. Device according to one of claims 6 and 7, characterised in that the evaporator (32) and the heating radiator (34) each extend along a plane inclined at an angle between 0° and 90° with respect to the horizontal.

9. Device according to claim 8, characterised in that the evaporator (32) extends along a plane inclined at an angle between 20° and 40° with respect to the horizontal.

10. Device according to one of claims 1 to 9, characterised in that it includes adjusting means (44d, 44g, 48) for producing an air flow at an adjusted temperature resulting from mixing, in a variable proportion, a warm air flow that has passed through the heating radiator (34, 36) and a cold air flow that has bypassed the heating radiator (34, 36).

11. Device according to claim 10, characterised in that the adjusting means in each case include, on the right and left sides, a side warm air channel (38d, 38g) passing through a portion of the heating radiator (34, 36) and a side cold air channel (40d, 40g) bypassing the side warm air channel, as well as a side mixing flap (44d, 44g) for distributing, in a variable proportion, the warm air flow in the side warm air channel and the cold air flow in the side cold air channel, with the side warm air channel (38d, 38g) and the side cold air channel (40d, 40g) jointly forming a side outlet (46d, 46g) of the heating module.

12. Device according to claim 11, characterised in that each side mixing flap (44d, 44g) is located in the heating module (12).

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13. Device according to claim 11, characterised in that each side mixing flap is located in a distribution module (16) located on the right or left side of the heating module (12).

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14. Device according to claim 9, characterised in that the adjusting means also include a central air channel (66) for warm air that has passed through a portion of the heating radiator (34, 36) and a central air channel (70) for cold air that has bypassed the central air channel (66), as well as a central mixing flap (72) for distributing, in a variable proportion, the air flow going to the central warm air channel (66) and the air flow in the central cold air channel (70), with the two central channels (66, 70) jointly forming a central outlet (74) of the heating module (12) arranged for supplying at least one other distribution module (76) for distributing an air flow at an adjusted temperature to the rear of the passenger compartment.

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15. Device according to claim 14, characterised in that the central mixing flap (72) is located in the heating module (12).

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16. Device according to claim 14, characterised in that the central mixing flap (72) is located in the other distribution module (76).

17. Device according to one of claims 14 to 16, characterised in that the adjusting means also include a distribution flap (73) that can move between a first position (73a) to send the air flow at an adjusted temperature to the side outlet(s) (46d, 46g) of the heating module (12) supplying the front of the passenger compartment, and a second position (73b) for sending the air flow at an adjusted temperature to the central outlet (74) of the heating module (12) supplying the rear of the passenger compartment.

18. Device according to one of claims 1 to 17, characterised in that it includes two side outlet chambers (108d, 108g) located downstream of the heating radiator (34, 36) and respectively leading to the side outlets (46d, 46g) of the heating module.

19. Device according to claim 18, characterised in that it also includes at least one side cold air channel (112d, 112g) for directly leading a cold air flow from the heating module (12), upstream of the heating radiator (34), to a distribution module (16) located on the right or left side.

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20. Device according to claim 18, characterised in that it also includes a central outlet chamber located downstream of the heating radiator (34, 36) and leading to a central outlet of the heating unit (12), and arranged to supply at least one other distribution module (76) for distributing an air flow at an adjusted temperature to the rear of the passenger compartment.

21. Device according to claim 18, characterised in that it also includes at least one central cold air channel for directly leading a cold air flow from the heating module (12), upstream of the heating radiator (34), to the other distribution module (76) or to a compartment to be cooled.

22. Device according to one of claims 1 to 18, characterised in that the distribution module(s) (16) each have a lower outlet (56) leading to the feet, an upper outlet (54) leading to the windshield and at least one intermediate outlet (58) that opens into the front area.

23. Device according to one of claims 1 to 9, characterised in that it includes adjusting means (104) acting on the flow, and therefore the temperature, of a coolant passing through the heating radiator (34) for producing an air flow at an adjusted temperature.

24. Device according to claim 23, characterised in that it includes two side outlet chambers (108d, 108g) located downstream of the heating radiator (34, 36) and respectively leading to the side outlets (46d, 46g) of the heating module.

25. Device according to claim 24, characterised in that it also includes at least one side cold air channel (112d, 112g) for directly leading a cold air flow from the heating module (12), upstream of the heating radiator

(34), to a distribution module (16) located on the right or left side.

26. Device according to claim 24, characterised in that
5 it also includes a central outlet chamber located downstream of the heating radiator (34, 36) and leading to a central outlet of the heating unit (12), and arranged to supply at least one other distribution module (76) for distributing an air flow at an adjusted
10 temperature to the rear of the passenger compartment.

27. Device according to claim 24, characterised in that it also includes at least one central cold air channel for directly leading a cold air flow from the heating
15 module (12), upstream of the heating radiator (34), to the other distribution module (76) or to a cooling compartment.

28. Device according to one of claims 1 to 24,
20 characterised in that the distribution module(s) (16) each have a lower outlet (56) leading to the feet, an upper outlet (54) leading to the windshield and at least one intermediate outlet (58) opening into the front area.

25 29. Device according to one of claims 1 to 28, characterised in that the modules (12, 14, 16) that constitute it are integrated in a transverse beam (128) of the vehicle.